

WHAT IS CLAIMED IS:

1. An optical film measuring device for measuring properties of a film of a measurement target at a predetermined film measurement position, comprising:

a photo-detector whose observation area is a region which is larger than the film measurement position;

a part for determining the film measurement position based on an image in an observation area taken in by the photo-detector;

a part for extracting a signal at the film measurement position from an observation area taken in by the photo-detector; and

a part for calculating by operations properties of the film based on the signal extracted by the signal extraction part.

2. The optical film measuring device according to claim 1, wherein in a case where an image of a measurement target to be taken in by the photo-detector is a periodic repetition of a pattern having a predetermined shape, the film measurement point determination part extracts any one of the patterns from the image of the measurement target taken in by the photo-detector and defines a predetermined position in this pattern as the film measurement position.

3. The optical measuring device according to claim 1, wherein the film measurement position determination part extracts a pattern registered beforehand from the image of

the measurement target taken in by the photo-detector and defines a predetermined position in this pattern as the film measurement position.

4. The optical film measuring device according to claim 3, comprising:

a part for registering in a storage part as the registered pattern a pattern extracted on the basis of a characteristic point when the characteristic point is specified from an outside through an input part on an image of a measurement target taken in by the photo-detector; and

a part for displaying the extracted pattern in a condition where the pattern is superimposed on an image in the observation area.

5. The optical film measuring device according to claim 3, comprising:

a part for extracting a pattern contained in a partial image and registering it in a storage part as the registered pattern when the partial image is specified from an outside through an input part on an image of a measurement target taken in by the photo-detector; and

a part for displaying the extracted pattern in a condition where the pattern is superimposed on an image in the observation area.

6. The optical film measuring device according to claim 3, comprising;

a part for extracting as a pattern a region which has a roughly constant luminosity and contains one point or one region when the one point or one region is specified from an outside through an input part on an image of a measurement target taken in by the photo-detector; and

a part for displaying the extracted pattern in a condition where the pattern is superimposed on an image in the observation area.

7. The optical film measuring device according to claim 1, comprising a spectroscopic part that can make only light in a predetermined wavelength band incident upon the photo-detector and selectively switch the wavelength band.

8. The optical film measuring device according to claim 7, wherein the spectroscopic part is set so that a contrast of an image may be highest when the film measurement position determination part determines the film measurement position based on the image in the observation area.

9. The optical film measuring device according to claim 1, wherein based on information about a configuration of a measurement target, a wavelength band of a spectroscopic image in which a contrast of an image to be taken in by the photo-detector becomes highest is obtained by calculations from an optical constant and a thickness of the measurement target registered beforehand.

10. The optical film measuring device according to claim 7, comprising a part for providing color display of

each pixel in a color that corresponds to a wavelength band having a highest detected light intensity in a visible light region of images that correspond to a plurality of obtained wavelength bands so that a film measurement position can be set on the color-displayed image.

11. The optical film measuring device according to claim 1, wherein in a case where an image of a measurement target to be taken in by the photo-detector is a periodic repetition of a pattern having a predetermined shape, the film measurement point determination part extracts a characteristic point of the pattern from the image of the measurement target taken in by the photo-detector and defines as the film measurement position a predetermined position with respect to the characteristic point.

12. The optical film measuring device according to claim 1, wherein in a case where an image of a measurement target to be taken in by the photo-detector has a frame-shaped pattern, a center of intersections of the patterns is defined as the film measurement point.

13. The optical film measuring device according to claim 1, wherein:

the film measurement position determination part determines a plurality of film measurement positions based on an image in the observation area taken in by the photo-detector: and

the film properties operation part obtains by operations properties of a film based on a signal extracted from the plurality of film measurement positions.

14. The optical film measuring device according to claim 1, wherein:

an image of a measurement target is taken in by the photo-detector in such a manner as to contain a corner of the measurement target; and

the corner of the measurement target is extracted from the image taken in by the photo-detector, to determine the film measurement position with respect to the corner of the measurement target thus extracted.

15. The optical film measuring device according to claim 1, wherein in a case where a plurality of measurement targets formed as divided on a substrate is to be measured:

an image of the measurement target is taken in by the photo-detector in such a manner as to contain a corner of the substrate; and

the corner of the substrate is extracted from the image taken in by the photo-detector, to determine the film measurement position of the measurement target with respect to the extracted substrate corner.

16. The optical film measuring device according to claim 15, wherein a region of the observation area where an image is taken in by the photo-detector can be set for each of product types.

17. The optical film measuring device according to claim 1, comprising a light source for emitting white light, a spectroscopic part equipped with spectroscopic filters for visible light to near-infrared light regions, and a part for measuring chromaticity and film thickness of a colored thin film.

18. The optical film measuring device according to claim 7, comprising a spectroscopic part in which a light source for emitting white light, a spectroscopic filter for a wavelength of about 450 nm, a spectroscopic filter for a wavelength of about 550 nm, a spectroscopic filter for a wavelength of about 650 nm, a plurality of spectroscopic filters for a visible light region, and a plurality of spectroscopic filters for near-infrared through infrared regions are arranged side by side, at least the spectroscopic filter for a wavelength of about 450 nm, spectroscopic filter for a wavelength of about 550 nm, and spectroscopic filter for a wavelength of about 650 nm being arranged consecutively in sequence.

19. The optical film measuring device according to claim 1, wherein reflected light and transmission light of light emitted from the light source with which a measurement target has been irradiated can be taken in by the photo-detector.